

**REMARKS**

**I. Status of the Claims**

Claims 16-30 are currently pending in this application.

Applicants thank the Examiner for withdrawing the rejection of claims 16-30 under 35 U.S.C. § 102(e) over U.S. Patent No. 5,707,732 ("Sonoda et al.") and the rejection of claims 16-30 under 35 U.S.C. § 103(a) as being unpatentable over Sonoda et al. in view of U.S. Patent No. 6,552,112 ("Redondo et al.").

**II. Rejections Under 35 U.S.C. § 103(a)**

(A) The Examiner has maintained the rejection of claims 16-30 under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 5,707,732 (Sonoda et al.) in view of U.S. Patent No. 6,262,151 B1 (Betso et al.) for the reasons disclosed on page 2 of the Final Office Action. Applicants respectfully traverse this rejection for at least the reasons previously presented and for the additional reasons set forth below.<sup>1</sup>

Applicants' invention is not obvious over Sonoda et al. in view of Betso et al. To establish a *prima facie* case of obviousness, the Examiner must show that three basic criteria have been met. See M.P.E.P. § 2143. Applicants submit that the Examiner has not and cannot show, at a minimum, that the prior art references teach or suggest all of the claim limitations, and that there is motivation in the references or in the knowledge generally available to one of ordinary skill in the art to combine the references in order to recreate Applicants' claimed invention. See M.P.E.P. §§ 2143.01 and 2143.03.

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<sup>1</sup> While not addressed here in full, Applicants maintain their position that the cited prior art does not teach or provide the motivation to use natural magnesium hydroxide.

**1. The references do not teach the hydrolysable organic silane limitation**

Applicants maintain that Sonoda et al. does not expressly or inherently disclose the limitation: “hydrolyzable organic silane groups grafted onto the polymer chain for compatibilization of the natural magnesium hydroxide with the polymeric components,” as presently claimed.

With respect to achieving compatibilization of its flame retardant fillers, Sonoda et al. merely discloses a well known procedure, *i.e.*, grafting an anhydride of an unsaturated aliphatic diacid, such as maleic anhydride, onto the copolymer. Col. 5, lines 36-47. In contrast, the present claims recite the use of hydrolysable organic silanes as the filler compatibilizer. In fact, Applicants have shown through test data that hydrolysable organic silanes are superior alternative filler compatibilizers compared to maleic anhydride, because they create “an optimum balance of mechanical properties.” See Specification at Table 2, p.27.

Applicants agree that Sonoda et al. also teaches optionally grafting a copolymer with a hydrolyzable organic silane group; however, as previously discussed, these grafts serve a wholly separate and distinct function. Sonoda et al.’s disclosure to optionally graft a copolymer with an alkenyl trialkoxy silane in the presence of an organic peroxide is an express disclosure of moisture curing (*i.e.*, cross-linking of the copolymer). See col. 6, lines 41-44. It is well understood that cross-linking a copolymer is not compatibilization of a filler with a polymeric component. See *e.g.*, Betso at col. 10, lines 42-58.

In response, the Examiner has asserted that “[t]here is no evidence on this record that the silane groups of Sonoda do not compatibilize the polymer with the magnesium hydroxide” and that “this teaching [of moisture curing] does not preclude some silane groups from compatibilizing. . . .” Final Office Action at 5. Applicants respectfully disagree.

As an initial point, Applicants note that the burden is not on Applicants to show that this would not occur. Rather, it is the Examiner’s burden to provide factual and technical grounds establishing that the claimed feature necessarily flows from the teachings of the prior art. See *Ex Parte Levy*, 17 U.S.P.Q.2d 1461, 1464 (Bd. Pat. App. & Int. 1990). The Office must cite facts in support of a Section 103 rejection and not the Office’s opinion. *In re Zurko*, 59 U.S.P.Q.2d 1693, 1697 (Fed. Cir. 2001) (“With respect to core factual findings in a determination of patentability, however, the Board cannot simply reach conclusions based on its own understanding or expertise . . . Rather, the Board must point to some concrete evidence in the record in support of these findings.”).

In this case, Sonoda et al. only discloses grafting a copolymer with an alkenyl trialkoxy silane under conditions for the purpose of cross-linking the copolymer and no other purpose. Col. 6, lines 41-56. Sonoda et al. does not teach grafting the copolymer with hydrolysable organic silane groups under conditions that result in compatibilization with the magnesium hydroxide filler, and the Examiner has not offered any evidence that such a result is likely or that there is a motivation to modify the conditions to promote compatibilization. It is well-established that the reference must direct those skilled in the art to the presently claimed invention **without any need for picking,**

**choosing, and combining various disclosures** within the reference not directly related to each other by the teachings of the cited reference. *In re Luvisi*, 144 U.S.P.Q. 646, 649-50 (C.C.P.A. 1965).

Moreover, contrary to the Examiner's suggestion, Betso et al. does not establish that compatibilization **will** occur. Betso et al. teaches that compatibilization of particle and polymer is not an inherent property of the silanes; only one of three possible outcomes, depending upon conditions. Col. 10, lines 42-58. Betso et al. expressly states that whether or not cross-linking, compatibilization, or some other coupling occurs is a function of (1) amount of ingredients, (2) types of ingredients, and (3) conditions to which ingredients are subjected. Col. 10, lines 59-61.

As the Applicants had pointed out in their September 10, 2003 Response, inherency "may **not be established by probabilities or possibilities**. The mere fact that a certain thing **may** result from a given set of circumstances is not sufficient." See M.P.E.P. § 2112 (citing In re Robertson, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999)). Thus, for Betso et al. to be evidence of record that establishes inherency, compatibilization must necessarily be present. See M.P.E.P. § 2112 (citing In re Rijckaert, 28 U.S.P.Q.2d 1955, 1957 (Fed. Cir. 1993)). Not a one in three chance.

Nevertheless, the record is replete with evidence that one of ordinary skill in the art **would not** expect the silane groups of Sonoda et al. to compatibilize.

First, as noted in Applicants' specification, Sonoda et al.'s anhydrides are more reactive than the organic silanes. Specification at 6, lines 27-30. Accordingly, one of ordinary skill in the art would expect Sonoda et al.'s anhydrides to react before the silanes.

Second, although the Office correctly points out that Sonoda et al. teaches grafting the copolymer with a hydrolyzable organic silane group, Sonoda et al. only teaches a person of ordinary skill the conditions wherein the result is entirely different from compatibilization between a polymer and a flame retardant filler. Rather, Sonoda et al. expressly teaches conditions wherein its copolymers are made hydrolyzable for the purpose of moisture curing, in the presence of a silanol condensation catalyst. See col. 6, lines 41-59. A person of ordinary skill in the art would recognize Sonoda et al.'s moisture curing as a well-known technique to **crosslink polymers** and **not** a technique to **couple filler particles** with the polymer. Once again, Applicants direct the Examiner's attention to an article previously presented to the Examiner: A Review of Fifteen Years Development in Moisture Curable Copolymers and a Future Outlook, [http://www.borealisgroup.com/public/pdf/customercentre/WC\\_Mumbai2002\\_Visico.pdf](http://www.borealisgroup.com/public/pdf/customercentre/WC_Mumbai2002_Visico.pdf) (discloses that Sonoda et al.'s process at col. 6, lines 28-56 is well-known to create crosslinking in copolymers not bonds between particles and polymers).

Third, a person of ordinary skill in the art reading Sonoda et al. in view of Betso et al. would not expect compatibilization. As discussed above, Betso et al. explains that cross-linking versus compatibilization versus some other coupling mechanism is a function of (1) amount of ingredients, (2) types of ingredients, and (3) conditions to which ingredients are subjected. Col. 10, lines 59-61. Here, Sonoda et al. expressly teaches the use of an ingredient for grafting, *i.e.*, the anhydride, which would compete with the silanes. Sonoda et al. also teaches conditions where the anhydride would compatibilize and where the silanes would cross-link. In view of Betso et al.'s explanation of the criticality of ingredients and conditions, a person of ordinary skill in

the art would not expect the environment to promote compatibilization by the silanes, when Sonoda et al. believes the conditions are set for cross-linking.

Applicants further submit that a person of ordinary skill in the art would not be motivated to modify the teachings of Sonoda et al. to obtain compatibilization by the grafted silanes. While Betso et al. does disclose that under some unknown conditions that this result may be achieved, that is not enough. First, Betso et al. fails to provide the person of ordinary skill in the art with the conditions to achieve this desired result. Second, a person of ordinary skill in the art would not be motivated to do so, since the anhydrides already do the job.

**2. The references do not teach  
the no appreciable cross-linking limitation**

Sonoda et al. details how once the polymer has been made hydrolysable, they are **moisture cured** (*i.e.*, cross-linked) in the presence of a silanol condensation catalyst. See col. 6, lines 41-59. Accordingly, Sonoda et al. does not recognize the limitation of “no appreciable cross-linking,” and, in fact, teaches away from that limitation when organosilanes are present. Therefore, Sonoda et al. does not expressly or inherently teach all the limitations of the claims.

In the Final Office Action, the Examiner asserted that the claimed limitation of “no appreciable cross-linking” does not exclude “some degree of cross-linking”, because Applicants did not specify the degree of cross-linking or gel content. Final Office action, at 6. Applicants respectfully disagree.

The claims recite that there is “no appreciable cross-linking.” “Appreciable” is a term of degree that means “capable of being perceived or measured.” See MERRIAM-

WEBSTER'S COLLEGIATE DICTIONARY 57 (10th ed. 1993) (courtesy copy attached). As discussed in detail above, Sonoda et al. discloses methods of cross-linking copolymers, including the amount of cross-linking agents and the temperatures **necessary** to achieve cross-linking. Col. 6, lines 28-56. Therefore, Sonoda et al. expressly teaches a perceivable, and measurable, amount of cross-linking of its copolymers.

For the foregoing reasons, Sonoda et al. in view of Betso et al. do not expressly or inherently teach all the limitations of the claims, or provide the necessary motivation to modify the teachings to achieve those limitations. Thus, the references fail to render the claims obvious and the present rejection should be withdrawn.

(B) The Office has rejected claims 16-30 under 35 U.S.C. § 103(a) as being unpatentable over Sonoda et al. as applied above to claims 16-30, in view of U.S. Patent No. 5,139,875 ("Metzemacher et al."), for the reasons given at pages 5-6 of the Office Action. Applicants respectfully traverse this rejection for at least the reasons presented below

In the Final Office Action, the Examiner stated that Matzemacher et al. is relied upon only to show that "it is known in the art to use natural magnesium hydroxide as a flame-retardant filler." Final Office Action at 8. Applicants do not agree with the Examiner's position that one of ordinary skill in the art would use natural magnesium hydroxide in the composition of Sonoda et al. However, since the Examiner does not deny Applicants' position that Metzemacher et al. does not cure the deficiencies in Sonoda et al., i.e., Sonoda et al. does not teach the "hydrolysable organic silane" and "no appreciable cross-linking" limitations, Applicants respectfully submit that this

rejection should be withdrawn for the same reasons presented above and incorporated by reference herein.

**III. Conclusion**

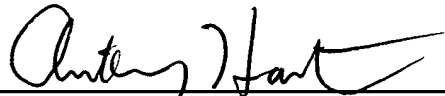
In view of the foregoing remarks, Applicants submit that this claimed invention is neither anticipated nor rendered obvious in view of the prior art references cited against this application. Applicants therefore request the Examiner's reconsideration and reexamination of the application, and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account no. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,  
GARRETT & DUNNER, L.L.P.

Dated: September 29, 2004

By:   
Anthony A. Hartman  
Reg. No. 43,662

Attachment: MERRIAM-WEBSTER'S COLLEGIATE DICTIONARY 57 (10th ed. 1993)



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